

## Theoretical spectrum of Earth's background free oscillations excited by pressure variation on the Earth's surface

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Earth's background free oscillations are a newly discovered phenomenon of the solid Earth. A candidate of exciting background free oscillations is random atmospheric disturbance. Two different formulae have been presented to relate atmospheric disturbance to Earth's free oscillations. We formulate the problem in the frequency domain on how the surface pressure variation (due to random atmospheric or oceanic loading) excites Earth's free oscillations. We then calculate the synthetic power spectra of Earth's free oscillations from the averaged power spectrum of atmospheric pressure variations in quiet days of the Syowa Station, Antarctica, which are compared to the observed spectra of Earth's background free oscillations.